An Investigation of Emotion Recognition Ability and Metacognitive Judgements of Emotion Recognition Performance in Trait Narcissism

Nikki Turner (BPsychSc)

A report submitted as a partial requirement for the degree of Bachelor of Psychological Science with Honours in Psychology at the University of Tasmania, 2017.

Statement of Sources

I declare that this report is my own original work and that contributions of others have been duly acknowledged.

_____

Nikki Turner Date: 19 October 2017

Acknowledgements

First and foremost, I would like to thank my research supervisor, Dr Cynthia Honan. Thank you for your involvement in every step of the process, without your understanding and support this thesis would not have been possible. I have been incredibly fortunate to have had a supervisor who is passionate about the research process and am incredibly grateful to have a supervisor who is so generous with her time and knowledge.

Thank you so very much to the participants who kindly volunteered their time to be involved in this study.

I have been incredibly lucky to have made some wonderful friendships over the past four years. Sarah, Caitlin and Madi, I appreciate your support and friendship that has made those long hours in the computer labs all the more memorable. I am grateful for the patience and humour you have shown a “mature age” student.

Finally, this could not have happened without the love and support of my family. Matt and Stella, your patience, understanding and support for which I am forever grateful. To my mum Charmayne, I cannot express how thankful I am for your love and encouragement, babysitting, general support and the many pots of soup and meals. When I did not think this would be possible, you did not give me a chance to give up. To my sisters and extended family, thanks for sharing this journey with me.

Table of Contents

List of Tables

List of Figures

List of Acronyms

APA	American Psychiatric Association
ANDI	Adjusted Normalised Discrimination Index
C	Calibration Statistic
DASS21	Depression, Anxiety and Stress Scale- 21 items
DSM	Diagnostic and Statistical Manual of Mental Disorders
ERT	Emotion Recognition Task
IRI	Interpersonal Reactivity Index
NPD	Narcissistic Personality Disorder
O/U	Overconfidence/Underconfidence
RSE	Rosenberg Self-Esteem Scale
SD3	Short Dark Triad
SEQ	Social Emotional Questionnaire

An Investigation of Emotion Recognition Ability and Metacognitive Judgements of Emotion Recognition Performance in Trait Narcissism.

Nikki Turner (BPsychSc)

Word Count: 9118

Abstract

Empathy deficits have been consistently found in people with Narcissistic Personality Disorder (NPD) and trait narcissism. However, few studies have examined underlying difficulties in social cognitive ability experienced in these individuals. This study was a preliminary investigation to determine whether individuals with higher levels of trait narcissism would experience difficulties identifying basic emotional expressions (anger, disgust, sadness, fear, happiness and surprise) and whether these individuals lack insight into their emotion perception abilities. Sixty participants aged between 18 and 35 (M = 24.17, SD = 5.26) completed the Short Dark Triad (SD3) and the Emotion Recognition Task (ERT) to assess emotion perception abilities. Metacognition of emotion recognition was assessed by obtaining confidence ratings (0% to 100%) for each presented emotion. The study identified trends towards those with higher trait narcissism experiencing emotion recognition difficulties, particularly for the emotions fear, sadness and surprise. They were also found to be more overconfident in their predictions of emotion recognition ability. The results provide preliminary evidence that higher levels of trait narcissism may be related to difficulties in emotion perception ability and metacognitive functioning concerning this ability. This might contribute to the underlying associated difficulties in empathy often seen in individuals high in trait narcissism.

‘Generation Y’ (those born after 1980) display higher levels of trait narcissism than any previous generation (Twenge & Foster, 2010). Narcissistic Personality Disorder (NPD) is a clinical disorder that causes considerable distress and impaired functioning to the individual (American Psychiatric Association [APA], 2013). Prevalence is estimated at up to 6.2% within the community. According to the APA, difficulties in social functioning derive from a sense of entitlement, general disregard for the wants and needs of others, fantasies of ideal love, and need for admiration. NPD is associated with many maladaptive behaviours causing difficulties for the individual, the largest impairment may be to social functioning, often causing considerable pain and duress to loved ones (Miller, Campbell, & Pilkonis, 2007). Narcissism can present as an enduring personality disorder or as an expression of short-term personality traits (Ronningstam, 2011).

Many healthy individuals display narcissistic personality traits with levels of impairment ranging from minimal to pathological (Levy, 2012; Miller, Lynam, Hyatt, & Campbell, 2017). The construct of subclinical or trait narcissism was developed by Raskin and Hall (1979), who intended to measure the extent to which ‘normally’ functioning individuals display traits associated with narcissism, based on characteristics of NPD in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; APA, 1980). Recently, a scale has been developed to investigate three socially aversive but non-pathological personality traits that have gained considerable attention: Machiavellianism, sub-clinical narcissism and sub-clinical psychopathy (Jones & Paulhus, 2013; Paulhus & Williams, 2002).

Although there are higher numbers of adolescent individuals with narcissistic traits than adults, having such traits does not necessarily mean that an individual will later develop NPD (APA, 2013; Twenge, 2013). One key difference between NPD

and trait narcissism is whereas trait narcissism is positively related to self-esteem, NPD is not (APA, 2013; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004; Twenge, 2013). Indeed, while the assessment of trait narcissism in a sub-clinical sample may be suggestive of a diagnosis of NPD, it is argued that its measurement in NPD is confounded by low self-esteem (Vater et al., 2013). Regardless, research on trait narcissism is useful to inform the scientific construction of knowledge on NPD (Miller & Campbell, 2010). Further, despite trait narcissism being positively associated with self-esteem, Miller et al. (2017), and Barry and Kauten (2014), argue that trait narcissism carries important negative implications given its association with the negative traits of callousness, grandiosity, exploitativeness, and manipulativeness. Thus, even though narcissistic traits are not pathological, there may still be a possibility of impaired social functioning.

People with narcissistic traits and NPD both experience difficulties in forming and maintaining relationships, reportedly due to a general disregard for the interpersonal sensitivities of others (APA, 2013). Interpersonal sensitivity involves the ability to perceive the emotions and thoughts of others and use judgements in appropriate situations (Hall, Andrzejewski, & Yopchick, 2009). It is possible that this disregard for others is due in part to underlying difficulties in social cognitive ability. Social cognition is defined as the ability to perceive, identify and interpret the interpersonal cues displayed by others and apply this information in social interactions (McDonald, Honan, Kelly, Byom, & Rushby, 2013). Emotion perception ability is a low-order social cognitive skill that is fundamental to successful engagement in social interactions. Accurately identifying the emotions of others (through facial expressions as well as through body language and tone of voice) is core to higher-order social cognitive abilities (such as theory of mind; an ability

attributing mental states to oneself and others, and the understanding that others have a perspective independent from one's own) and is integral to social well-being, effective communication, and forming and maintaining relationships (Gallagher & Frith, 2003; Konrath, Corneille, Bushman, & Luminet, 2013; Montagne, Kessels, De Haan, & Perrett, 2007).

Narcissism and Empathy

Both the ability to recognise emotions and metacognitive ability may be important components of empathy. Empathy is the ability to understand and share the feelings of another (Davis, 1983; Marissen, Deen, & Franken, 2012). Empathic ability is important as it is central in building and maintaining lasting relationships. In fact, empathy is a key diagnostic criteria for NPD, with these individuals demonstrating difficulties in connecting with others (APA, 2013; Konrath et al., 2013). This has also been demonstrated in a subclinical population (Wai & Tiliopoulos, 2012). Few studies, however, have examined the cognitive factors that may underlie empathy difficulties in these individuals. Interestingly, however, those with NPD and high trait narcissism have been found to display deficits in emotional empathy (the ability to experience and react to the perceived emotions of another person), but not cognitive empathy (a similar construct to theory of mind) (Davis, 1983; Jonason & Krause, 2013; Ritter et al., 2011; Wai & Tiliopoulos, 2012). Thus, it appears that the difficulties experienced in NPD and trait narcissism may be largely driven by a lack of understanding and interpretations of the emotions displayed by others rather than a lack of understanding of the thoughts and intentions of others.

Emotion Perception Ability

Research assessing emotional competencies in a narcissistic population has primarily focussed on self-report scales involving empathy, perspective taking,

interpersonal sensitivity, social desirability and emotional and social intelligence (Ames & Kammrath, 2004; Delič, Novak, Kovačič, & Avsec, 2011; Vonk, Zeigler-Hill, Mayhew, & Mercer, 2013; Watson & Morris, 1991). The method of self-report employed in these studies may contribute to inconsistent findings. Self-report methods may be vulnerable to social desirability bias and the tendency for narcissists to respond in a way that makes them look good (Marissen et al., 2012; Morf & Rhodewalt, 2001). To avoid problems with response bias, emotion recognition tasks have been frequently employed in similar populations such as psychopathy (Blair, 2007; Dolan & Fullam, 2006; Kosson, Suchy, Mayer, & Libby, 2002). Consequently, the way in which those with trait narcissism perceive and use emotional information is an area that requires further research.

Emotion perception is the ability to perceive and recognise affective information in others (Bornhofen & Mcdonald, 2008; Kelly & Metcalfe, 2011). The information perceived by an individual from another person's facial expression elicits a response, and the response may be positive or negative based on what is initially perceived (Marsh, Kozak, & Ambady, 2007). For instance, a person expressing the emotion fear, if interpreted correctly, is likely to elicit a response in the observer based on the perceived knowledge that something may threatening in the environment and that safety may be at risk (Frith, 2009). The ability to recognise and appropriately respond to emotions displayed by facial expressions in other people is, therefore, critical to all social interactions. Impairment in the ability to perceive emotions accurately, may limit a person's ability to experience the emotions displayed by others (i.e., may lower empathetic ability), and consequently may result in poor interpersonal skills, impoverished relationships and antisocial behaviour (Decety, Skelly, Yoder, & Kiehl, 2014; Marsh & Blair, 2008; Marsh et al., 2007).

Indeed, those with NPD have demonstrated dysfunction in work-related outcomes, personal and interpersonal functioning (Ronningstam, 2011). Impairment in **e**motion perception ability may partially explain these difficulties.

One study assessed accuracy on a facial recognition task for emotions displayed at 100 percent intensity levels in patients with NPD (Marissen et al., 2012). Participants were asked to identify static pictures of five emotional expressions (sad, anger, fear, happiness, and disgust). The researchers concluded that NPD patients had a general deficit for recognising emotions, particularly for the negatively valenced emotions of fear and disgust. Furthermore, despite performing worse than controls on the emotion recognition task, NPD patients reported that they would be able to identify the feelings of others as well as controls. Wai and Tiliopoulos (2012) assessed emotion identification ability in the dark triad members by presenting static black and white images of basic emotional expressions (fear, happy, sad, and angry) and found no significant emotion perception deficits associated with trait narcissism. Prior research has often examined emotion perception using static photos at 100% intensity (i.e., Ekman & Friesen, 1976). However, this is not reflective of everyday life in which emotional expressions are dynamic. New tasks have been developed to illuminate individual differences in the ability to perceive emotions displayed across varying intensity levels (Montagne et al., 2007). Such tasks may be capable of detecting more subtle impairments in emotion perception in high trait narcissism individuals.

There is very limited research to make a priori predictions about the function of valence on emotion recognition ability, however examining valence is important to gain an understanding of the specific deficits in emotion recognition ability demonstrated by those high in trait narcissism. There is some evidence that shows

those high in trait narcissism and NPD may be more likely to recognise positive emotions (i.e., happy, surprise) as they seek to confirm positive affection from others (APA, 2013; Konrath et al., 2013). There is also evidence that antisocial populations demonstrate specific deficits recognising fear, sadness and surprise (Marsh & Blair, 2008). General deficits in emotion perception ability have been identified in people with psychopathy and alexithymia, two groups highly associated with trait narcissism (Dimaggio et al., 2007; Hastings, Tangney, & Stuewig, 2008; Jonason & Krause, 2013; Pera-Guardiola et al., 2016; Vize, Lynam, Collison, & Miller, 2016). Whether these difficulties identifying emotions extend to those high in trait narcissism in a sub-clinical population is unknown. It is plausible that those with trait narcissism will also demonstrate difficulties perceiving the emotions of others.

Metacognitive Ability

In addition to difficulties in developing and maintaining-relationships, individuals with NPD also tend to be self-aggrandising and experience difficulties in metacognitive ability – a higher order cognitive process involving the ability to understand the thought processes and feelings of one's self and others and then use this knowledge to control cognitive processes such as problem solving and learning (Dimaggio et al., 2007). In regard to emotion recognition ability, accurate metacognition allows the individual to monitor their ability to accurately perceive emotional information and based on their judgements about their level of accuracy, they may adjust their response to the emotional information accordingly (Kelly & Metcalfe, 2011). For example, if someone accurately and confidently identifies an angry expression in another person it would elicit a timely and appropriate response, thus enhancing social connectivity. Similarly, if an individual is unable to identify the displayed emotion, if they have good metacognition they will be aware of this

and consequently adjust their response to compensate for their difficulty so that their response may be more socially appropriate. Problems arise when an individual has little insight of their ability (i.e., poor metacognition) and therefore is unable to accurately monitor their performance and adjust their responding.

Poor self-monitoring occurs when an individual poorly estimates their performance in comparison to their actual performance (Campbell, Goodie, & Foster, 2004). NPD and trait narcissism tend to have inflated estimates of ability or overconfidence in actual ability (APA, 2013; Campbell et al., 2004). This has been demonstrated in those with trait narcissism in research involving self-rated predictions of intelligence testing, attractiveness, performance in a group, judgements of ideal personality, emotional intelligence, and predictions of course grades (Farwell & Wohlwend-Lloyd, 1998; Gabriel, Critelli, & Ee, 1994; John & Robins, 1994; Park & Colvin, 2014; Petrides, Vernon, Schermer, & Veselka, 2011). Interestingly, despite self-reports of greater expected performance in these studies, no relationship between trait narcissism and actual ability was demonstrated. Farwell and Wohlwend-Lloyd (1998) investigated the relationship between trait narcissism and self-enhancement. They found, those high in trait narcissism were excessively positive in assessments of current academic performance, predicted they would obtain higher grades, and attributed success in a partnered task to their own ability but not their partner's ability. This is not surprising considering the tendency of those with NPD to self-aggrandise, overestimate their ability and devalue the contribution of others (APA, 2013).

Whereas social cognition is an ability, emotional intelligence refers to a personality construct involving the recognition, understanding and management of the emotions of oneself and others (Mayer & Salovey, 1993). A positive relationship

between narcissism and self-reported social and emotional intelligence has been identified (Delič et al., 2011; Petrides et al., 2011). It is possible, the relationship with social and emotional intelligence self-reported in these studies could be explained by the desire of the narcissist to maintain a grandiose perception of themselves. A primary motive behind narcissistic behaviour is ego-reinforcement. The need for ego-reinforcement drives the narcissist to reorganise cognitive information in order to preserve self-esteem when the ego is threatened (Morf & Rhodewalt, 2001). The ability to interpret the emotions of others is not necessary to maintain a grandiose perception of self, this is evident by low affective empathy and difficulties recognising the feelings of others demonstrated by trait narcissists (Jonason & Krause, 2013). Thus, when ability is questioned, a reaction may be to over inflate estimates of ability in tasks involving social cognitive ability, such as an emotion recognition task.

A lack of metacognitive ability has also been demonstrated in those with trait narcissism in an interpersonal perception task and face to face negotiation exercise (Ames & Kammrath, 2004). The interpersonal perception task is a higher-order social cognition task that evaluates social judgements and theory of mind ability. When asked about their sensitivity to the feelings of others, those high in trait narcissism self-reported the same levels of sensitivity to the feelings of others than non-narcissists. Participants also completed a negotiation task in pairs, followed by a questionnaire about their own and their partner's intentions. High trait narcissists were more likely to self-report themselves as competent in reading their partner's intentions and emotions than non-narcissists. As expected, actual performance ability was not predicted by self-estimates of performance however, higher estimates of performance were predicted by high trait narcissism. The authors postulate this may

have to do with the tendency of those with high trait narcissism to be self-aggrandising. This indicates there may be a lack of insight into their social cognitive ability. Thus, this lack of insight may in turn mean that these individuals experience difficulties in successful self-monitoring of their behaviour and the provision of necessary adjustments to facilitate effective and positive social interaction. It is unknown whether these same effects occur in lower-order social cognitive ability such as basic emotion perception ability.

According to Dimaggio et al. (2002) in patients with NPD, poorer metacognitive functioning is predominantly associated with difficulties identifying inner affect as well as cognitive egocentrism (deficits in understanding another's mind and the inability to decentrate). This metacognitive deficit is reinforced by the constant need for grandiosity in which those with NPD tend to avoid negative mental states. It has been postulated that people with NPD and high levels of trait narcissism have comorbid alexithymia, a non-clinical condition described by an inability to identify and describe one's emotions (Dimaggio et al., 2007; Dimaggio et al., 2002; Jonason & Krause, 2013). Jonason and Krause (2013) found trait narcissism to be positively correlated with difficulty identifying and describing feelings which are two subscales of the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994). Dimaggio et al. (2007) also found patients with NPD had significant difficulties identifying inner affect. It is plausible that those who have trouble identifying their own emotional states will have difficulties identifying those of another.

Brain Structures Associated with Emotion Perception Ability

Many brain structures have been associated with recognising emotions from stimuli, including facial expressions (Adolphs, 2008). Areas of the brain associated with processing of facial affect include the amygdala, ventromedial pre-frontal

cortex, anterior cingulate cortex, insula, ventral striatum, and the occipitotemporal cortex (Marsh & Blair, 2008; Phillips, Drevets, Rauch, & Lane, 2003). Additionally, separate neural systems are partially responsible for processing each type of emotional expression (Adolphs, Damasio, Tranel, & Damasio, 1996; Marsh & Blair, 2008). Specifically, the insula and basal ganglia are particularly important for the recognition of disgust, the amygdala plays a vital role in interpreting fearful expressions, the ventral striatum in recognising anger and the ventrolateral prefrontal cortex in the recognition of fearful and angry expressions (Adolphs, 2008; Adolphs, Tranel, Damasio, & Damasio, 1995; Baskin-Sommers, Krusemark, & Ronningstam, 2014; Besel & Yuille, 2010; Marsh & Blair, 2008). Thus, it may be expected that people with abnormal functioning in these areas may experience emotion perception difficulties.

Brain Structures Compromised in those with Narcissism and NPD

Individuals with NPD and high trait narcissism have demonstrated compromised functioning in similar regions of the brain identified to be associated with emotion perception. A functional magnetic resonance imaging (FMRI) study compared low and high trait narcissists and found that those endorsing high levels of narcissism had significantly decreased activation in the right anterior insula when viewing emotional expressions (Fan et al., 2011). Schulze et al. (2013) compared those with NPD to healthy controls and found that individuals with NPD had reduced gray matter in the left anterior insula, prefrontal cortex, rostral and medial cingulate cortex and fronto-paralimbic brain regions.

In applying these findings to empathetic abilities, a key domain of difficulty for those with NPD and high-trait narcissism, a meta-analysis conducted by Fan, Duncan, de Greck, and Northoff (2011) revealed that these same brain regions

formed part of a core neural network involved in the expression of empathy. The left-anterior insula in particular has been implicated in both cognitive and emotional empathy, whereas the right-anterior insula has been implicated only in emotional or affective empathy (Baskin-Sommers et al., 2014; Fan et al., 2011; Schulze et al., 2013). Thus, compromised function in these areas of the brain may contribute to the difficulties in recognising and understanding the emotions of others.

The Dark Triad

Recently there has been growing interest in the dark triad of personality. The dark triad involves three connected, yet distinct personality traits- sub-clinical narcissism, Machiavellianism and sub-clinical psychopathy, distinguished by malevolent, exploitative and emotionally cold characteristics (Nagler, Reiter, Furtner, & Rauthmann, 2014; Paulhus & Williams, 2002). All three demonstrate emotional deficits such as limited interest or motivation to communicate emotional information, low empathic functioning, callousness, exploitativeness, and interpersonal manipulation (Dowgwillo & Pincus, 2017; Jonason & Krause, 2013; Jones & Paulhus, 2013). Although emotion perception is considered fundamental in social interactions, Konrath et al. (2013) have discussed the possibility that emotion recognition ability may be used in an antisocial way to manipulate others. While certain factors may lead to an expectation of dysfunctional emotional competency (i.e., low empathy), it is argued those who score high on other factors (i.e., exploitativeness) may actually demonstrate better emotional competency, consequently used to manipulate others for self-benefit (Nagler et al., 2014; Paulhus & Williams, 2002). For instance, the ability to exploit others, while undesirable, would require some level of interpersonal skill (Nagler et al., 2014). Those with Machiavellianism have been found to use theory of mind ability to manipulate and

deceive others (Frith & Frith, 2005). Konrath et al. (2013), found exploitativeness (i.e., manipulating others to benefit one's self) was associated with recognising significantly more negatively valenced emotions. However, the same study found an association between increased empathy and better recognition of both positive and negative emotions. Conversely, a link between antisocial behaviour and difficulties identifying sad, surprised and particularly fearful expressions has also been identified (Marsh & Blair, 2008). It has been suggested that the ability to identify distress related cues such as fear, plays a large role in preventing antisocial behaviour (Marsh et al., 2007). To date, limited research has evaluated how those higher in the dark traits perceive and use emotional information (Jonason & Krause, 2013; Konrath et al., 2013).

There is evidence that people high in the dark triad personalities have difficulties identifying and processing negative valence emotions, possibly due to desensitisation towards the negative emotions displayed by others (Ali, Amorim, & Chamorro-Premuzic, 2009; Wai & Tiliopoulos, 2012). Of the dark triad, narcissism has gained the least attention regarding emotional competencies (Petrides et al., 2011). Poor recognition of emotional expressions in others has been predominantly demonstrated in a psychopathic population (Decety et al., 2014; Dolan & Fullam, 2006; Hastings et al., 2008; Kosson et al., 2002). However, considering the similarities present in those with narcissism, similar deficits may be expected (Marsh et al., 2008).

Aims and Hypotheses

The current study aims to examine the ability of those with higher levels of trait narcissism to correctly identify basic emotional facial expressions (anger, disgust, sadness, fear, happiness and surprise). Given the increase in trait narcissism

demonstrated in adolescents (Twenge & Foster, 2010) and the associated interpersonal difficulties (APA, 2013), whether the ability to perceive a range of emotions is compromised in these individuals is an important question. Prior research has only examined emotion perception ability in NPD patients with static pictures presented at full emotion intensity (100% intensity). Here, those with NPD were found to have specific deficits in the ability to identify the emotions fear and disgust (Marissen et al., 2012). Emotion recognition ability in trait narcissism has also only been examined in an affective empathy facial responding task, which employed black and white static images including fully displayed emotions at 100% level of intensity (Wai & Tiliopoulos, 2012). The lack of findings in this study may have been due to the insufficient examination of subtle emotion displays, which are thought to more accurately reflect the type of emotion perception that occurs in real-world social interactions. Hence, it is a limitation of the prior research that the assessment of emotional displays at 100% intensity lack ecological validity (Honan, Skromanis, Johnson, & Palmer, in press). This study will therefore include an assessment of emotion perception ability across a range of facial emotional expressions displayed at varying levels of intensity. The examination of emotion perception ability across various levels of intensity has illuminated more specific details in impairment in other clinical groups with known emotion perception difficulties such as traumatic brain injury (Rosenberg, McDonald, Dethier, Kessels, & Westbrook, 2014). Whether these individuals lack insight into their emotion perception abilities will also be examined. The current study may provide insight into the mechanisms that underlie empathic difficulties in this population, and provide important information for the development of strategies and treatments to assist those who experience such difficulties.

It is hypothesised that: (1) Higher levels of trait narcissism will be negatively associated with correctly identifying a range of basic facial emotional expressions, particularly those emotions displayed at lower intensity levels (i.e., where there is increased difficulty) and for the negatively valenced emotions of fear and disgust. (2) Higher levels of trait narcissism will be associated with poorer metacognitive functioning about facial emotion perception performance.

Method

Design

This study was a cross sectional correlational study, which examined the relationship between emotion perception ability for six basic emotions (anger, disgust, sadness, fear, happiness and surprise) at various intensity levels (0-20%, 0-40%, 0-60%, 0-80%, and 0-100%) and scores on a recently developed measure of trait narcissism. The relationship between metacognitive functioning about emotion perception performance and trait narcissism was also examined.

Participants

Participants consisted of 60 individuals who were either first year psychology students at the University of Tasmania, recruited through an advertisement on SONA (who received 45 minutes course credit for participation) or members of the wider community (who received a $20 gift voucher for participation). There were 20 males and 40 females between the ages of 18 and 35 (M = 24.17, SD = 5.26). The focus for recruitment was primarily on ‘Generation Y’ individuals (born after 1980). This was based on research by Twenge and Foster (2010) who demonstrated increased levels of narcissism within this cohort compared to previous generations. Exclusion criteria included those who do not have normal or corrected to normal vision, severe depression (scores above 21 on the DASS21), a history of traumatic brain injury or

other neurological condition, and pregnancy. Sixty-six individuals completed the screening questionnaire, however, three of these were excluded as they did not meet the inclusion criteria and three did not respond following the initial survey.

An a priori power analysis was conducted using G*Power 3.1.9.2. A study by Marissen et al. (2012) found a large between group effect (d = 1.05) in the performance of NPD participants on a facial emotion recognition task compared to healthy control participants. Thus, a linear multiple regression evaluating the relationship between 'trait narcissism' and emotion recognition ability is expected to produce at least moderate effects. Based on an estimated Cohen's f of .15, an alpha of .05, and power of .80, it is estimated that at least 55 participants will be required to detect significant effects. However, this study aimed to collect data from 60 participants to ensure a more robust analysis.

Materials

Emotion Recognition Task (*ERT*; Montagne et al., 2007). The ERT is a computerised task that measures an individual's ability to identify six basic universal emotions (anger, disgust, sadness, fear, happiness and surprise). Each emotional expression appears in a video clip presented on one of either two male or two female Caucasian faces. The video clips are presented in a predetermined, random order that increase in length, beginning with a neutral face and morphing through five intensity levels, proceeding from the lower to higher intensities (0-20%, 0-40%, 0-60%, 0-80%, and 0-100%). There are 120 trials in total, with each emotion type displayed four times at each intensity level. Participants responded using a six-alternative, forced-choice format of the six emotions.

Metacognition of emotion recognition was assessed by asking participants to verbally rate their performance on each item on the ERT. Specifically, participants

rated their level of confidence in correctly identifying the emotional expression (e.g., 'how confident do you feel that you got the answer correct with 0% being not at all confident and 100% being very confident').

Self-Report Questionnaires

Short Dark Triad (*SD3;* Jones & Paulhus, 2013). The SD3 is a 24-item measure assessing three, 9-item subscales: subclinical narcissism, Machiavellianism, and subclinical psychopathy. Participants indicate the extent to which they agree with each statement (e.g., Machiavellianism subscale: 'I like to use clever manipulation to get my way'; Narcissism subscale: 'I have been compared to famous people'; Psychopathy subscale: 'Payback needs to be quick and nasty'), rated on a 5-point Likert scale, with responses ranging from 1 = 'disagree strongly' to 5 = 'agree strongly'. A mean score is calculated for the nine items that define each subscale. The narcissism subscale is primarily of interest to the present study. All three subscales demonstrate fair internal consistency (narcissism $\alpha = .74$, Machiavellianism $\alpha = .71$, and psychopathy $\alpha = .77$) (Jones & Paulhus, 2013).

Rosenberg Self-Esteem Scale (*RSE;* Rosenberg, 1965). The RSE is a 10-item measure assessing levels of positive (e.g., 'On the whole, I am satisfied with myself') and negative (e.g., 'At times I think I am no good at all') feelings of self-worth. Participants are asked to rate items on a 4-point Likert scale ranging from 1 = 'strongly agree' to 4 = 'strongly disagree'. All items are summed with higher scores indicating higher self-esteem. The RSE was included to examine current self-esteem as a possible covariate of the present study. In a healthy population, narcissism has been identified to correlate positively with self-esteem (Twenge, 2013). The RSE is a highly reliable measure of self-esteem and has good internal consistency (Cronbach's

α = .88), as demonstrated in a large study involving undergraduate students (Gray-Little, Williams, & Hancock, 1997).

Depression, Anxiety and Stress Scale - 21 (*DASS21;* Lovibond & Lovibond, 1995). The DASS21 consists of three self-report scales developed to measure levels of negative emotional states - depression, anxiety and stress in the previous week. Each subscale includes seven items (e.g., 'I felt down-hearted and blue', 'I was aware of dryness of my mouth', and 'I found it hard to wind down, respectively'). Responses are rated on a 4-point Likert scale ranging from 0 = 'Did not apply to me at all' to 3 = 'Applied to me very much, or most of the time'. A total score is summed for each of the three scales and multiplied by two to give a total score. On the depression scale, participants with scores greater than 21 (indicating severe levels of depressed emotional state in the previous week) were excluded from the study. The DASS21 was included to examine current mood as a possible covariate of the present study. A large scale study involving a non-clinical sample reported excellent internal consistency for the total scale (Cronbach's α = .93) and good internal consistency for the depression scale (Cronbach's α = .82) (Henry & Crawford, 2005).

Interpersonal Reactivity Index (*IRI;* Davis, 1980). The IRI was developed to measure four different dimensions of the overall construct of empathy. The IRI includes 28-items in total, divided into a seven-item subscale for each dimension (fantasy, perspective taking, personal distress and empathic concern), rated on a 5-point Likert scale (e.g., 'A = Does not describe me well', to 'E = Describes me very well'). Items on the empathic concern scale measure sympathy, compassion, and concern for others. The perspective taking scale assesses the ability to understand the perspective and point of view of others. The personal distress scale consists of items assessing one's feelings when observing another person's distress and the fantasy

scale measures the extent to which an individual identifies with fictitious characters and situations. The IRI was included in the study to assist in characterizing the present sample (i.e., by assessment the relationship between narcissism and cognitive and emotional empathy). The IRI demonstrates fair internal reliability (Cronbach's α > .70) and good construct validity as determined by factor analysis (Carey, Fox, & Spraggins, 1988; Davis, 1980, 1983; Delič et al., 2011).

Social Emotional Questionnaire (*SEQ;* Hornak et al., 2003). The SEQ was included to assess social cognitive functioning. An adapted version of the questionnaire was used including 19 of the original 30 items based on factor analysis (Hornak et al., 2003). The SEQ consists of five subscales including emotion recognition (5 items), interpersonal relationships (3 items), antisocial behavior (4 items), emotional empathy (4 items) and public behavior (3 items). Participants are asked to rate the degree to which they agree with an item (e.g., 'I express my feelings appropriately in public') on a 5-point Likert scale (1 = 'strongly disagree') to (5 = 'strongly agree'). Higher scores indicate better social adjustment. The factor analysis conducted by Hornak et al. (2003) ensures good construct validity for the subscales. The SEQ was used in the present study to assist in characterizing the present sample (i.e., by assessment of the relationship between narcissism and general self-reported social functioning).

Procedure

Participants were asked to read participant information regarding the study and complete a screening questionnaire via Survey Monkey to assess eligibility. Information collected in the screening questionnaire included demographic information, medical history relevant to eligibility, the DASS21 and a form to give informed consent. Following completion of the screening questionnaire, participants

were given an anonymous identification number and a link to complete baseline assessments on survey monkey. The baseline assessments included the DASS21, SD3, IRI, SEQ, and the RSE. Following completion of the baseline tasks, participants attended a pre-arranged appointment to complete the computerised ERT and give a confidence rating (0-100%) on their perceived performance on each emotion recognition trial. Participants were thanked for their time and given either course credit or a $20 voucher.

Statistical Analyses

Analysis of data was conducted on IBM SPSS Version 24. Correlational analyses were conducted to assess relationships between trait narcissism, depression, anxiety, stress and self-esteem. All correlations between trait narcissism and the DASS21 subscales and the RSE were statistically non-significant and all correlations indicated minimal effect ($r < .18$) and were therefore not included in the regression analyses as a covariate.

A series of multiple regressions were conducted to examine the relationship between trait narcissism, emotion perception ability (emotion: anger, disgust, sadness, fear, happiness and surprise), and levels of emotion perception intensity (intensity: 0-20%, 0-40%, 0-60%, 0-80%, and 0-100%). Alpha levels were assessed at $\alpha = .05$ for all statistical analyses. Nevertheless, due to small sample size, this study was intended as a preliminary investigation examining the relationship between trait narcissism, emotion perception ability and perceptions of ability. Thus, emphasis will be placed on effect size to interpret results according to the guidelines of Cohen (1992; 1988). Correlations were interpreted using the following values, .10 indicates a small effect, .30 a moderate effect and .50 a large effect (Cohen, 1992). For semi-partial correlation squared (sr^2), values were interpreted according to

Cohen (1988), .01 indicates a small effect, .09 a moderate effect and, .25 a large effect.

Assumptions for all analyses were checked. This included independence of observations, outliers, multicollinearity, and linearity, homoscedasticity, and normality of residuals. Independence of observations was assumed as the Durbin-Watson statistic was in the 1.5- 2.5 range. For multiple regressions at 20%, 40%, and 80% intensity on the ERT, there were no violations of assumptions. There was evidence of heteroscedasticity at 60% and 100% intensity so a non-parametric bootstrapping procedure was performed using 1000 bias corrected samples. Given there were no meaningful differences in significance values for the 60% intensity regression, the original regression was reported. The bootstrapping procedure for the regression at 100% intensity revealed a quantitatively significant value, therefore alternate bootstrapping analysis significance values were reported. The Adjusted Normalized Discrimination Index (ANDI) and Calibration (C) statistic had a possible problem with heteroscedasticity, therefore non-parametric bootstrapping procedures were employed using 1000 bias corrected samples. As there were no meaningful differences in significance values, the original regressions were reported.

Emotion Perception Accuracy. Calibration analyses measure the relationship between objective (accuracy) on a task and the subjective (confidence) probability that an event will occur (Weber and Brewer 2004) and were conducted to examine the relationship between perceived emotion perception ability and actual emotion perception accuracy on emotion recognition performance. In this study, calibration will be assessed in three ways- the Calibration statistic, Over/Under confidence statistic (O/U), and ANDI statistic. For perfect calibration, the confidence rating given by an individual is equal to the proportion of correct responses on a task

(for example, items that are rated with 10% confidence will be correct 10% of the time) (Palmer, Brewer, Weber, & Nagesh, 2013). The calibration statistic measures how far a value deviates from perfect calibration (0 = perfect calibration, 1 = worst possible calibration). The O/U statistic is an overall measure of an individual's predisposition to over or underestimate their ability. Complete under confidence is given a value of -1, ranging through to +1 indicating complete confidence. To obtain the O/U statistic, the difference between mean confidence and mean accuracy is calculated (Weber & Brewer, 2004). Lastly, ANDI is an index that evaluates resolution- the degree to which an individual's confidence ratings can discriminate between correct and incorrect responses (Yaniv, Yates, & Smith, 1991, Palmer et al., 2013, Vredeveldt & Sauer, 2015). The ANDI statistic gives a value ranging from 0 (no resolution) to 1 (perfect discrimination).

Results

Baseline Assessments

Pearson correlations were conducted to assess the linear relationship between the various self-report measures and trait narcissism (See Table 1 for descriptive statistics and correlations). These analyses indicated the SD3 subscales, trait psychopathy and Machiavellianism both had moderate significant positive relationships with trait narcissism. SEQ components, interpersonal relationships and public behavior both had a moderate significant negative relationship with trait narcissism. The RSES, DASS-21, and IRI subscales were not significantly correlated with trait narcissism with only negligible-to-small positive correlations present.

ERT Performance

To estimate the proportion of variance in trait narcissism accounted for by emotion recognition ability, five standard multiple regression analyses were

conducted (one for each emotion intensity). The results of the regression for 20% intensity (See Table 2) indicated in combination, all six emotion types (happy, surprise, fear, anger, disgust, and sad) accounted for a non-significant 9% variance in trait narcissism, R^2 = .09, adjusted R^2 = -.01, F(6, 59) = .93, p = .483. At 40% emotion intensity (See Table 3), in combination, all six emotion types accounted for a non-significant 14% variability in trait narcissism, R^2 = .14, adjusted R^2 = -.05, F(6, 59) = 1.49, p = .200. Although the overall regression was non-significant, fear was a possible moderate-to-large independent predictor of trait narcissism which predicted 11% of unique variance. The zero-order correlation was also moderate and negative. The results for 60% emotion intensity (See Table 4) indicated, in combination, all six emotion types accounted for a non-significant 17% variability in trait narcissism, R^2 = .17, adjusted R^2 = .08, F(6, 59) = 1.91, p = .097. However, although the overall regression was non-significant, surprise and sadness were possible moderate independent predictors of trait narcissism with 7% and 6% of unique variance accounted for, respectively. The zero-order correlations for both surprise and sadness were moderate and negative. The results of the regression for 80% intensity (See Table 5) indicated that in combination, all six emotion types accounted for a non-significant 16% variability in trait narcissism, R^2 = .16, adjusted R^2 = .07, F(6, 59) = 1.71, p = .136. No individual predictors emerged in this regression. At 100% emotion intensity (See Table 6), the results of the regression indicated that, in combination, all six emotion types also accounted for a non-significant 17% variability in trait narcissism, R^2 = .17, adjusted R^2 = .08, F(6, 59) = 1.81, p = .115. Although the overall regression was non-significant, at 100% intensity sad was a possible moderate independent predictor of trait narcissism accounting for 6% of the unique variance (p =.011). The zero-order correlation was moderate and negative.

Table 1

Descriptive Statistics for Self-Report Measures and Correlations with Trait Narcissism

	M	*SD*	*r*	*p*
SD3				
Narcissism	2.46	.54	-	-
Machiavellianism	2.69	.60	.31*	.018
Psychopathy	2.16	.55	.47**	< .001
SEQ				
Emotion Recognition	21.15	2.29	-.19	.158
Interpersonal Relationship	10.38	1.80	-.35**	.006
Antisocial Behaviour	13.28	3.06	-.22	.092
Emotional Empathy	16.02	2.16	-.13	.319
Public Behaviour	11.37	1.76	-.42**	.001
IRI				
Fantasy	12.17	3.85	.16	.213
Perspective Taking	14.90	3.08	.03	.824
Empathic Concern	14.17	2.55	.14	.278
Personal Distress	11.98	3.42	.03	.834
Rosenberg Self-Esteem Scale	16.60	1.52	.18	.178
DASS-21				
Depression	6.00	5.34	.02	.882
Anxiety	4.33	5.41	-.01	.925
Stress	10.17	7.29	.11	.387

Note. SD3 = Short Dark Triad, SEQ = Social Emotional Questionnaire, IRI = Interpersonal Reactivity Index, DASS-21 = Depression, Anxiety and Stress Scale.

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Table 2

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores at 20% Intensity.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	2.25 (.75)	-.43 [-2.28, 1.42]	-.07	-.14	.00	.645
Surprise	1.27 (.88)	-1.01 [-2.58, .56]	-.18	-.21	-.03	.203
Fear	.73 (.92)	.30 [-1.13, 1.73]	.06	.00	.00	.673
Anger	2.32 (.83)	-.46 [-2.04, 1.11]	-.08	-.12	.00	-.589
Disgust	1.45 (.89)	-1.06 [-2.56, .44]	-.19	-.20	.03	.162
Sad	.77 (.91)	-.06 [-1.58, 1.46]	-.01	.04	.00	.935

Note. *B* = unstandardised beta, *β* = standardised beta, *r* = zero-order correlation, *sr* = semi-partial correlation, *M* and *SD* Values Provided are for Emotion Recognition Ability At 20% Intensity.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 3

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores at 40% Intensity.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	3.72 (.56)	-.21 [-2.52, 2.09]	-.02	-.00	.00	.853
Surprise	2.87 (.91)	-.20 [-1.64, 1.24]	-.04	-.09	.00	.784
Fear	1.05 (.89)	-1.88 [-3.35, -.41]	-.34	-.32**	.11	.013
Anger	3.23 (.95)	-.35 [-1.72, 1.02]	-.07	-.12	.05	.612
Disgust	2.98 (.98)	.38 [-.95, 1.72]	.08	-.03	.00	.568
Sad	1.17 (.99)	-.74 [-2.08, .60]	-.15	-.17	.02	.273

Note. *B* = unstandardised beta, *β* = standardised beta, *r* = zero-order correlation, *sr* = semi-partial correlation, *M* and *SD* Values Provided are for Emotion Recognition Ability At 40% Intensity.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 4

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores at 60% Intensity.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	3.92 (.28)	2.32 [-2.18, 6.83]	.13	.05	.02	.306
Surprise	2.62 (.85)	-1.53 [-2.98, -.07]	-.27	-.25*	.07	.040
Fear	1.22 (1.04)	-.82 [-2.04, .39]	-.18	-.22*	.03	.180
Anger	3.38 (.76)	.60 [-1.06, 2.25]	.09	.05	.00	.471
Disgust	3.27 (.86)	.14 [-1.30, 1.58]	.03	.00	.00	.846
Sad	1.73 (1.13)	-1.13 [-2.26, .00]	-.26	-.24*	.06	.050

Note. *B* = unstandardised beta, *β* = standardised beta, *r* = zero-order correlation, *sr* = semi-partial correlation, *M* and *SD* Values Provided are for Emotion Recognition Ability At 60% Intensity.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 5

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores at 80% Intensity.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	3.97 (.18)	-4.34 [-11.69, 3.02]	-.16	-.17	.02	.242
Surprise	2.73 (.71)	-.68 [-2.48, 1.12]	-.10	-.16	.00	.450
Fear	1.42 (.94)	-.44 [-1.94, 1.05]	-.09	-.24*	.00	.554
Anger	3.28 (.90)	-.42 [-1.92, 1.09]	-.08	-.15	.00	.583
Disgust	3.10 (.92)	-.81 [-2.25, .63]	-.15	-.21	.02	.264
Sad	2.43 (1.16)	-.84 [-1.98, .29]	-.20	-.28	.03	.143

Note. *B* = unstandardised beta, *β* = standardised beta, *r* = zero-order correlation, *sr* = semi-partial correlation, *M* and *SD* Values Provided are for Emotion Recognition Ability At 80% Intensity.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores at 100% Intensity.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	3.97 (.18)	4.25 [-5.04, 10.38]	.16	.01	.02	.387[b]
Surprise	2.68 (.77)	-.08 [-2.52, 1.84]	-.01	-.17	.00	.953[b]
Fear	1.65 (1.02)	-.98 [-2.37, .42]	-.21	-.26*	.03	.159 [b]
Anger	3.43 (.74)	-.81 [-3.32, 1.23]	-.12	-.20	.01	.433 [b]
Disgust	3.25 (.86)	-.21 [-1.47, 1.04]	-.04	-.17	.00	.757 [b]
Sad	2.53 (.98)	-1.36 [-2.48, .214]	-.27	-.30**	.06	.011 [b]

Note. *B* = unstandardised beta, *β* = standardised beta, *r* = zero-order correlation, *sr* = semi-partial correlation, *M* and *SD* Values Provided are for Emotion Recognition Ability At 100% Intensity, [b] = *p*-values are an adjusted value based on a bootstrapping analysis that used 1,000 bootstrapped samples and a 95% bias corrected confidence interval.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Calibration Analyses

Partial correlations were conducted to assess the overall linear relationship between the three indices of calibration and trait narcissism. These analyses indicated the ANDI [$r(58) = .05$, $p = .694$] and Calibration Statistic [$r(58) = -.161$, $p = .219$] were not significantly correlated with trait narcissism (See Figure 1). The O/U statistic had a significant, moderate positive relationship with trait narcissism, $r(58) = .387$, $p = .002$ (See Figure 1).

Calibration Statistic. Multiple regression analyses were conducted to ascertain whether those higher in trait narcissism were poorer at matching performance accuracy with subjective ratings of performance according to the calibration statistic (See Table 7). The analysis indicated, in combination, all six emotion types for the calibration statistic accounted for a non-significant 18% variability in trait narcissism, $R^2 = .18$, adjusted $R^2 = .09$, $F(6, 59) = 1.97$, $p = .087$. Although the overall regression was non-significant**,** anger was a significant independent predictor of trait narcissism, accounting for a moderate 8% unique variance, and the zero-order correlation was moderate and negative.

ANDI Statistic. Multiple regression analyses were conducted to assess whether those with higher levels of trait narcissism had more difficulty discriminating between correctly and incorrectly identified emotions according to the ANDI statistic. The results of the analysis indicated, in combination, all six emotion types for the ANDI statistic accounted for a moderate 8% variability in trait narcissism, $R^2 = .08$, adjusted $R^2 = -.02$, $F(6, 59) = .78$, $p = .593$ (See Table 8). Although the overall regression was non-significant, fear was a significant independent predictor of trait narcissism, accounting for 6% unique variance, and the zero-order correlation was weak to moderate and positive.

O/U Statistic. Multiple regression analyses were conducted to identify if participants with higher trait narcissism are more confident in judgements of ability, relative to their actual performance. The results of the analysis indicated, in combination, all six emotion types for the O/U statistic accounted for a significant 23% variability in trait narcissism, R^2 = .23, adjusted R^2 = -.14, $F(6, 59) = 2.60$, p = .028 (See Table 9). Although there was no emotion that appeared to predict trait narcissism at least to a moderate effect size level, there were several notable moderate and positive zero-order correlations. The strongest of these correlations was fear, followed by surprise, sadness and happy.

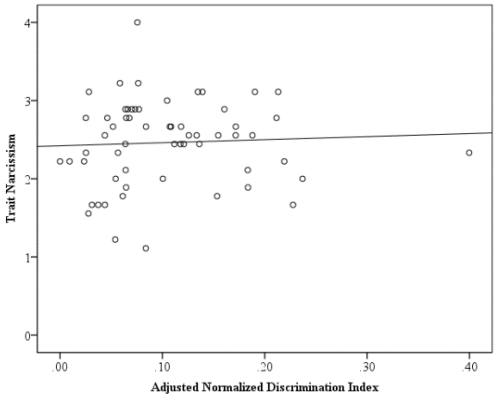

Figure 1. (A)

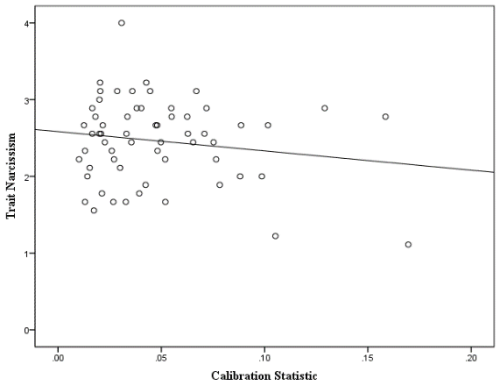

Figure 1. (B)

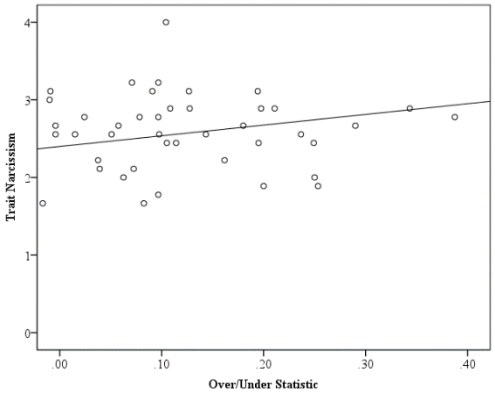

Figure 1. (C)

Figure 1. (A) Overall relationship between mean scores on the SD3 narcissism subscale and the Adjusted Normalized Discrimination Index. Pearson's $r(58) = .05$, p =.694. (B) Overall relationship between mean scores on the SD3 narcissism subscale and the Calibration Statistic. Pearson's $r(58) = -.16$, p =.219. (C) Overall relationship between mean scores on the SD3 narcissism subscale and the Over/Under Statistic. Pearson's $r(58) = .39$, $p = .002$.

Table 7

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores for the ANDI statistic.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	.65 (.36)	-.10 [-4.01, 3.81]	-.01	.06	.00	.959
Surprise	.15 (.18)	4.91 [-2.74, 12.56]	.18	.15	.03	.204
Fear	.16 (.24)	5.19 [-.56, 10.93]	.25	.21*	.06	.076
Anger	.24 (.25)	.45 [-4.77, 5.68]	.02	.02	.00	.863
Disgust	.27 (.29)	.56 [-4.21, 5.33]	.03	.06	.00	.814
Sad	.16 (.20)	-2.18 [-9.30, 4.95]	-.09	.03	.00	.542

Note. *B* = unstandardised beta, *β* = standardised beta, r = zero-order correlation, *sr* = semi-partial correlation, ANDI = Adjusted Normalized Discrimination Index. *M* and *SD* Values Provided are for the ANDI statistic.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 8

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores for the Calibration statistic.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	.07 (.05)	5.50 [-28.57, 39.58]	.06	-.23*	.00	.747
Surprise	.15 (.08)	-2.13 [-17.99, 13.72]	-.03	.02	.00	.788
Fear	.27 (.13)	6.59 [-3.67, 16.85]	.17	.24*	.03	.203
Anger	.10 (.06)	-29.25 [-54.71, -3.79]	-.38	-.35**	.08	.025
Disgust	.10 (.07)	7.62 [-11.90, 27.14]	.11	.06	.00	.437
Sad	.14 (.09)	7.08 [-8.84, 23.00]	.13	.14	.01	.376

Note. B = unstandardised beta, *β* = standardised beta, r = zero-order correlation, *sr* = semi-partial correlation. *M* and *SD* Values Provided are for the Calibration Statistic.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 9

A Regression Model with the Various Emotions Predicting Trait Narcissism Scores for the O/U statistic.

	M (SD)	*B* [95% CI]	*β*	*r*	sr^2	*p value*
Happy	-.14 (.12)	1.90 [-14.80, 18.59]	.05	.26*	.00	.821
Surprise	.06 (.20)	2.84 [-6.57, 12.25]	.12	.36**	.00	.574
Fear	.33 (.22)	6.72 [-.71, 14.14]	.31	.41**	.05	.075
Anger	-.09 (.18)	-5.37 [-16.03, 5.29]	-.20	.20	.01	.317
Disgust	-.04 (.20)	-2.13 [-10.22, 5.97]	-.09	.22*	.00	.601
Sad	.15 (.22)	6.60 [-1.69, 14.89]	.30	.36**	.04	.116

Note. *B* = unstandardised beta, *β* = standardised beta, r = zero-order correlation, *sr* = semi-partial correlation, O/U = Over/Under Confidence. *M* and *SD* Values Provided are for the O/U Statistic.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Discussion

The current study aimed to conduct a pilot examination of the relationship between trait narcissism levels and the ability to identify basic emotional facial expressions (anger, disgust, sadness, fear, happiness and surprise) across different emotion intensities (20%, 40%, 60%, 80%, and 100%). Metacognitive ability of emotion recognition performance in trait narcissism was also examined.

The first hypothesis, that higher levels of trait narcissism will be negatively associated with correctly identifying a range of basic facial emotional expressions and emotions displayed at lower intensity levels (i.e., where there is increased difficulty) was partly supported by the results. Although none of the regressions were significant overall, moderate effects were identified at 40%, 60%, 80% and 100% intensity levels for the relationship between emotion recognition ability and trait narcissism scores. This suggests there may be a meaningful relationship between emotion recognition ability and trait narcissism, however the extent to which this is the case will need to be investigated in a larger follow-up study.

The prediction that higher levels of trait narcissism will have specific deficits in identifying negative valence emotions fear and disgust was also partly supported by the results. The ability to detect fearful emotional facial expressions accounted for a significant amount of unique variance in trait narcissism at 40% and 60% intensity levels, indicating higher levels of trait narcissism may trend towards poorer performance in perceiving fear, particularly at lower intensity levels. At 60% emotion intensity, surprise accounted for a significant amount of trait narcissism, and sadness accounted for a significant amount of trait narcissism at both 60% and 100% intensity levels, indicating higher levels of trait narcissism may trend towards more difficulty identifying sadness at higher intensity levels.

To our knowledge, this is the first study to examine emotion recognition ability in trait narcissism, by employing dynamic facial expressions. The findings may therefore be an important preliminary investigation of how those higher in narcissistic traits perceive a range of basic emotions. One prior study by Wai and Tiliopoulos (2012) found no significant emotion recognition deficits associated with trait narcissism. However, their differences in methodology, owing to the use of static images displayed only at 100% intensity, may have accounted for the lack of findings. The current study employed the use of dynamic videos across various levels of emotion intensities to illuminate possible relationships with the ability to detect more subtle emotions.

Given the emergence of several possible independent predictors of trait narcissism (fear, sad, and surprise) at various emotion intensities in the current study, it is highly plausible that with a more powerful sample, overall significance may be found. Marissen, Deen and Franken (2012) observed general deficits in facial recognition ability and specific deficits in recognising the emotions fear and disgust for NPD patients. While no difficulties identifying disgust were found in the current study, there were significant trends towards difficulties identifying fear at lower intensities for those higher in trait narcissism. This is an interesting finding as it is consistent with previous research involving individuals with psychopathy who share a similar pattern of empathic deficits (Birbaumer et al., 2005; Marsh & Blair, 2008; Marsh et al., 2008; Ritter et al., 2011). Psychopathy is largely correlated with narcissism and has an overlap in expression such as reduced empathy, callousness and grandiosity (Fossati, Pincus, Borroni, Munteanu, & Maffei, 2014; Ronningstam & Baskin-Sommers, 2013). A general deficit in emotion recognition, particularly for negative valence emotions (sadness, fear, and disgust) and poorer recognition of

emotions displayed at lower intensity levels (60% intensity) have been detected in those with psychopathy (Blair et al., 2004; Blair, Colledge, Murray, & Mitchell, 2001; Hastings et al., 2008; Kosson et al., 2002; Montagne et al., 2005). Thus, trends towards difficulty identifying fear and sadness in trait narcissism in the current study show some consistency with prior research involving psychopathy. The current study has not controlled for psychopathy, but a future study with a larger sample should examine the extent to which it may mediate the relationship between narcissism, emotion perception ability and metacognitive functioning. According to Furnham, Richards, and Paulhus (2013), due to the positive relationship between the dark triad members, the dark triad should be assessed together in order to determine the shared variance between triad members.

At 60% intensity, surprise accounted for a significant amount of trait narcissism. Surprise is typically associated with having a lack of valence or being of mixed valence. In fact, prior studies have shown fear as being incorrectly labelled as surprise (Honan, Skromanis, Johnson, & Palmer, in press). Trends towards higher trait narcissists having more difficulty identifying sadness at higher intensity levels (60% and 100%) is an interesting finding. The ability to identify distress related cues has been found to play a large role in preventing antisocial behaviour (Marsh et al., 2007). Sadness has been identified as a particularly difficult expression to identify even in a healthy population (Montagne et al., 2007). This is due to very subtle changes when making a sad face in comparison to a neutral expression. As such, it would be unexpected to find associations between trait narcissism and sadness at lower intensity levels (i.e., where there is increased difficulty) where everyone would potentially experience difficulty. Although the current study only gives preliminary insight into the possible difficulties identifying sadness and fear in higher trait

narcissists, there are a couple possible explanations for the findings. Firstly, difficulties identifying both sadness and fear may relate to reduced empathy identified in trait narcissists. Specifically, previous research has found higher trait narcissists to be lacking in the emotional component of empathy (Davis, 1983; Jonason & Krause, 2013; Ritter et al., 2011; Wai & Tiliopoulos, 2012). Secondly, Wai and Tiliopoulos (2012) found that those higher in dark triad traits are desensitised to the negative emotions of others. Reduced empathy and a desensitisation to the negative emotions of others may partially explain trends towards difficulties identifying fear and sadness, but further studies are required. The current study contributes to the understanding of those who experience emotion perception deficits, particularly for negatively valenced stimuli such as fear and sadness.

The second hypothesis, that higher levels of trait narcissism will be associated with poorer metacognitive functioning about facial emotion perception performance was supported by the results of the O/U statistic. The O/U statistic is an overall measure of an individual's predisposition to over- or under-estimate their ability. Overall, those higher in trait narcissism were more confident when predicting emotion perception ability. The results of the current study substantiate previous findings in the literature in which over-confidence in ability has been consistently found in high trait narcissists (Ames & Kammrath, 2004; Farwell & Wohlwend-Lloyd, 1998; Gabriel et al., 1994; John & Robins, 1994; Park & Colvin, 2014; Petrides et al., 2011).

The current study found no relationship between perceptions of emotion recognition performance and actual performance ability according to the calibration statistic (self-reported estimated performance minus actual performance). This is

contrary to expectations that higher trait narcissists would be less well calibrated than low trait narcissists. Non-significance of the Calibration Statistic indicates self-rated perceptions of performance were no more predictive of performance in low trait narcissists than higher trait narcissists. These findings contradict expectations that higher trait narcissists will have less insight into their social cognitive ability than low trait narcissists. However, the calibration statistic did uncover a moderate positive effect, indicating a relationship between trait narcissism and poorer calibration. Further research would be needed to determine exactly how trait narcissism is associated with calibration.

The overconfidence in perceptions of ability by trait narcissists in the current study cannot be explained by higher self-esteem. Contrary to prior research, there was no relationship between trait narcissism and self-esteem (Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004; Twenge, 2013). This may be partly explained by a relatively homogenous sample of trait narcissism in the current study. Significant moderate negative relationships with the SEQ subscales *interpersonal relationships* and *public behaviour* were found. The negative association between higher trait narcissists and interpersonal relationships was not surprising as a disregard for the interpersonal sensitivity of others has been demonstrated in both trait narcissists and those with NPD (APA, 2013). The negative association with public behaviour was unexpected. Those higher in trait narcissism generally tend to make a positive first impression on strangers (Back, Schmukle, & Egloff, 2010).

Metacognition of emotion is a relatively new area of research and insight into ability is important above basic emotion recognition ability. The ability to accurately interpret behavioural cues of others and monitor and reflect on performance has implications for improving emotion recognition ability, promoting learning, ensuring

flexibility in social interactions, and consequently improving relationships with others (Kelly & Metcalfe, 2011). Evaluating emotion perception ability as well as meta-cognitive functioning together increases the ecological validity of the study (Honan, Skromanis, Johnson, & Palmer, in press). Real world interactions are dependent on the ability of an individual to recognise accuracies and inaccuracies, recognising and interpreting emotions. For individuals high in trait narcissism, insight into their abilities is important as it may act as a catalyst to improve negative behaviours. This study has provided some preliminary evidence that higher levels of trait narcissism may be related to difficulties in emotion perception ability and metacognitive functioning. These processes may account for some of the communication and social difficulties experienced in those with narcissistic traits.

Limitations and Future Directions

There are a few noteworthy limitations of the current study. Firstly, the current study was limited by the small sample size. No consistent patterns in the data may be an indication that the small sample size was not powerful enough to detect significant effects. With moderate effect sizes, Tabachnick and Fidell (2013) recommend a sample of 104 + *k* (predictors) as having adequate power to detect significant effects. Given the promising pilot results, it would be worth increasing the current sample of participants to more thoroughly examine the possible emerging relationships that were detected.

Secondly, trait narcissism scores also indicated that the sample was best characterised by low-to-moderate levels of trait narcissism. This may be partially reflected by the greater proportion of female (67%) to male (33%) participants. In a clinical population, men make up 50% to 75% of those with NPD (APS, 2013). This has also been found in a sample of trait narcissists. A recent study involving 653

undergraduate students found men scored significantly higher than women on the narcissism subscale of the SD3 (Dowgwillo & Pincus, 2017). Scores on the SD3 narcissism subscale in the present study are lower than overall scores found by Dowgwillo and Pincus (2017) (M =2.94, SD = 0.53) and slightly lower than norms based on a sample of 387 undergraduate students (M = 2.8, SD = .88) (Jones & Paulhus, 2013). Men have also been found to be generally less accurate and less sensitive at identifying basic facial expressions on an emotion recognition task (Montagne, Kessels, Frigerio, de Haan, & Perrett, 2005). Thus, results of the current study may apply only to a restricted sample of people (i.e., that are not overly high trait narcissists) restricting the generalisability of the results. Future research may benefit from a gender balanced sample and those higher in trait narcissism.

The current study was also limited in so far as the SD3 did not encompass the full approach of examining trait narcissism. The narcissism scale in the SD3 is represented by the grandiose expression of narcissism (Jones & Paulhus, 2013). Recent literature has noted, there are two subtypes associated with narcissism-vulnerable and grandiose narcissism (Miller, Gentile, Wilson, & Campbell, 2013; Miller et al., 2014; Miller et al., 2017; Vonk et al., 2013). Grandiose and vulnerable narcissism have been found to vary considerably in relationships with different aspects of social cognitive ability such as theory of mind and social reasoning (Vonk et al., 2013). Additionally, individuals higher in vulnerable narcissism often respond to interpersonal threat with emotional reactivity (APA, 2013; Besser & Priel, 2010). This indicates that including a vulnerable dimension of narcissism in research involving emotion recognition ability would be particularly relevant. Future studies on the current topic are therefore recommended, in order to evaluate the heterogeneity of the construct of trait narcissism and NPD, both grandiose and

vulnerable narcissism should be evaluated. In this case, a task such as the Pathological Narcissism Inventory (Pincus et al., 2009) could be employed.

Another limitation is the way in which the intensity levels are presented in the ERT. It is reasonable to expect that 'intensity' may be more of an indication of time passed than actual intensity of the displayed emotion. While evaluating intensity allows for subtle impairments in emotion perception ability to be evaluated, it is unlikely emotions would emerge from a neutral expression in a natural social interaction. As such, it would be beneficial to examine emotion recognition ability using more ecologically valid measures displaying real life interactions such as The Awareness of Social Inference Test Emotion Perception subtest (Honan, McDonald, Sufani, Hine, & Kumfor, 2016).

Emotion perception is a lower-order social cognitive ability thought to contribute to higher-order cognitive abilities such as theory of mind. However, it is important to highlight that other social cognitive processes may contribute to higher-order social cognitive functions and/or interact with emotion perception ability. A meta-analysis conducted by Vazire and Funder (2006), for instance, found a strong positive relationship between impulsivity and trait narcissism. Such impulsivity may include an inability to inhibit unacceptable automatic social responding in favour of a more socially acceptable response. In traumatic brain injured individuals, it has been demonstrated that there is a lack of ability to inhibit self-referential thoughts in order to understand the perspective of another and respond appropriately (i.e., McDonald et al., 2014). This inability to inhibit self-referential thinking may be similar to the type of aggrandisement that is characteristic of those high in trait narcissism. Thus, it would be interesting to conduct a study investigating the interaction between emotion perception ability and the ability to inhibit socially inappropriate responses in those

high in trait narcissism. This may contribute further to our understanding of the way those high in trait narcissism may respond in a social context.

Conclusion

Empathy deficits have been consistently found in people with NPD and trait narcissism. Both the ability to recognise emotions and metacognitive ability are important components underlying empathy. However, whether those higher in trait narcissism have difficulties identifying the emotional expressions displayed by others and perceptions of emotion recognition ability is an area that has not been previously researched. The current study identified trends towards higher trait narcissists experiencing emotion recognition difficulties, particularly for the emotions fear, sadness and surprise. Previous research has identified overconfidence in ability in higher trait narcissists across a range of tasks. However, prior research has failed to examine whether this extends to perceptions of emotion recognition ability. Consistent with previous research, higher trait narcissists were found to be more overconfident in their predictions of emotion recognition ability than low trait narcissists. This study has provided some preliminary evidence that higher levels of trait narcissism may be related to difficulties in emotion perception ability and metacognitive functioning concerning this ability. These processes may account for some of the communication and social difficulties experienced in those with narcissistic traits.

References

Adolphs, R. (2008). Fear, faces, and the human amygdala. *Current Opinion in Neurobiology, 18,* 166-172. doi: 10.1016/j.conb.2008.06.006

Adolphs, R., Damasio, H., Tranel, D., & Damasio, A. R. (1996). Cortical systems for the recognition of emotion in facial expressions. *Journal of Neuroscience, 16,* 7678-7687. Retrieved from: http://www.jneurosci.org/content/16/23/7678

Adolphs, R., Tranel, D., Damasio, H., & Damasio, A. R. (1995). Fear and the human amygdala. *Journal of Neuroscience, 15,* 5879-5891. Retrieved from: http://www.jneurosci.org/content/jneuro/15/9/5879.full.pdf

Ali, F., Amorim, I. S., & Chamorro-Premuzic, T. (2009). Empathy deficits and trait emotional intelligence in psychopathy and Machiavellianism. *Personality and Individual Differences, 47,* 758-762. doi: 10.1016/j.paid.2009.06.016

Ames, D. R., & Kammrath, L. K. (2004). Mind-reading and metacognition: Narcissism, not actual competence, predicts self-estimated ability. *Journal of Nonverbal Behavior, 28,* 187-209. doi: 10.1023/B:JONB.0000039649.20015.0e

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Back, M. D., Schmukle, S. C., & Egloff, B. (2010). Why are narcissists so charming at first sight? Decoding the narcissism–popularity link at zero acquaintance. *Journal of Personality and Social Psychology, 98,* 132-145. doi: 10.1037/a0016338

Bagby, R. M., Parker, J. D. A., & Taylor, G. T. (1994). The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research 38,* 23-32. doi: 10.1016/0022-3999(94)90005-1

Barry, C. T., & Kauten, R. L. (2014). Nonpathological and pathological narcissism: which self-reported characteristics are most problematic in adolescents? *Journal of Personality Assessment, 96,* 212-219. doi: 10.1080/00223891.2016.1193812

Baskin-Sommers, A., Krusemark, E., & Ronningstam, E. (2014). Empathy in narcissistic personality disorder: From clinical and empirical perspectives. *Personality Disorders: Theory, Research, and Treatment, 5*, 323-333. doi: 10.1037/per0000061

Besel, L. D., & Yuille, J. C. (2010). Individual differences in empathy: The role of facial expression recognition. *Personality and Individual Differences, 49,* 107-112. doi: 10.1016/j.paid.2012.01.008

Besser, A., & Priel, B. (2010). Grandiose narcissism versus vulnerable narcissism in threatening situations: Emotional reactions to achievement failure and interpersonal rejection. *Journal of Social and Clinical Psychology, 29,* 874-902. doi: 10.1521/jscp.2010.29.8.874

Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., & Flor, H. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. *Archives of General Psychiatry, 62,* 799-805. doi: 10.1001/archpsyc.62.7.799

Blair, R. J. R. (2007). Empathic dysfunction in psychopathic individuals. In T. Farrow & P. Woodruff (Eds.), *Empathy in mental illness* (pp. 3-16). doi: 10.1017/CBO9780511543753.002

Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of abnormal child psychology, 29,* 491-498. doi: 10.1023/A:1012225108281

Blair, R., Mitchell, D., Peschardt, K., Colledge, E., Leonard, R., Shine, J., . . . Perrett, D. (2004). Reduced sensitivity to others' fearful expressions in psychopathic individuals. *Personality and Individual Differences, 37,* 1111-1122. doi: 10.1016/j.paid.2003.10.008

Bornhofen, C., & Mcdonald, S. (2008). Emotion perception deficits following traumatic brain injury: A review of the evidence and rationale for intervention. *Journal of the International Neuropsychological Society, 14,* 511-525. doi: 10.1017/S1355617708080703

Campbell, W. K., Goodie, A. S., & Foster, J. D. (2004). Narcissism, confidence, and risk attitude. *Journal of Behavioral Decision Making, 17,* 297-311. doi: 10.1002/bdm.475

Carey, J. C., Fox, E. A., & Spraggins, E. F. (1988). Replication of structure findings regarding the interpersonal reactivity index. *Measurement and Evaluation in Counseling and Development, 21,* 102-105. Retrieved from: IRI%20psychometrics.pdf

Cohen, J. (1992). A power primer. *Psychological bulletin, 112,* 155. doi: 10.1037/0033-2909.112.1.155

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology, 10*, 85. Retrieved from: http://www.uv.es/~friasnav/Davis_1980.pdf

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113-126. doi: 10.1037/0022-3514.44.1.113

Decety, J., Skelly, L., Yoder, K. J., & Kiehl, K. A. (2014). Neural processing of dynamic emotional facial expressions in psychopaths. *Social Neuroscience, 9,* 36-49. doi: 10.1080/17470919.2013.866905

Delič, L., Novak, P., Kovačič, J., & Avsec, A. (2011). Self-reported emotional and social intelligence and empathy as distinctive predictors of narcissism. *Psychological Topics, 20*, 477-488. Retrieved from: http://hrcak.srce.hr/78734

Dimaggio, G., Procacci, M., Nicolò, G., Popolo, R., Semerari, A., Carcione, A., & Lysaker, P. H. (2007). Poor metacognition in narcissistic and avoidant personality disorders: Four psychotherapy patients analysed using the metacognition assessment Scale. *Clinical Psychology & Psychotherapy, 14*, 386-401. doi: 10.1002/cpp.541

Dimaggio, G., Semerari, A., Falcone, M., Nicolò, G., Carcione, A., & Procacci, M. (2002). Metacognition, states of mind, cognitive biases, and interpersonal cycles: Proposal for an integrated narcissism model. *Journal of Psychotherapy Integration, 12*, 421-451. doi: 10.1037//1053-0479.12.4.421

Dolan, M., & Fullam, R. (2006). Face affect recognition deficits in personality-disordered offenders: association with psychopathy. *Psychological Medicine, 36*, 1563-1569. doi: 10.1016/j.paid.2008.01.004

Dowgwillo, E. A., & Pincus, A. L. (2017). Differentiating dark triad traits within and across interpersonal circumplex surfaces. *Assessment, 24*, 24-44. doi: 10.1177/1073191116643161

Ekman, P., & Friesan, W. V. (1976). *Pictures of facial affect.* Palo Alto, CA: Consulting Psychologists Press.

Fan, Y., Duncan, N. W., de Greck, M., & Northoff, G. (2011). Is there a core neural network in empathy? An fMRI based quantitative meta-analysis. *Neuroscience & Biobehavioral Reviews, 35*, 903-911. doi: 10.1016/j.neubiorev.2010.10.009

Fan, Y., Wonneberger, C., Enzi, B., de Greck, M., Ulrich, C., Tempelmann, C., . . . Northoff, G. (2011). The narcissistic self and its psychological and neural correlates: An exploratory fMRI study. *Psychological Medicine, 41*, 1641-1650. doi:10.1017/S003329171000228X

Farwell, L., & Wohlwend-Lloyd, R. (1998). Narcissistic processes: Optimistic expectations, favorable self-evaluations, and self-enhancing attributions. *Journal of Personality, 66*, 65-83. doi: 10.1111/1467-6494.00003

Frith, C., & Frith, U. (2005). Theory of mind. *Current Biology, 15,* 644-645. doi: 10.1016/j.cub.2005.08.041

Fossati, A., Pincus, A. L., Borroni, S., Munteanu, A. F., & Maffei, C. (2014). Are pathological narcissism and psychopathy different constructs or different names for the same thing? A study based on Italian nonclinical adult participants. *Journal of Personality Disorders, 28*, 394-418. doi: 10.1521/pedi_2014_28_127

Frith, C. (2009). Role of facial expressions in social interactions. *Philosophical Transactions of the Royal Society of London B: Biological Sciences, 364*, 3453-3458. doi: 10.1098/rstb.2009.0142

Furnham, A., Richards, S. C. & Paulhus, D. L. (2013). The dark triad of personality: A 10 year review. *Social and Personality Psychology Compass, 7*, 199–216. doi: 10.1111/spc3.12018

Gabriel, M. T., Critelli, J. W., & Ee, J. S. (1994). Narcissistic illusions in self-evaluations of intelligence and attractiveness. *Journal of Personality, 62*, 143-155. doi: 10.1111/j.1467-6494.1994.tb00798.x

Gallagher, H. L., & Frith, C. D. (2003). Functional imaging of 'theory of mind'. *Trends in Cognitive Sciences, 7,* 77-83. doi: 10.1016/S1364-6613(02)00025-6

Gray-Little, B., Williams, V. S., & Hancock, T. D. (1997). An item response theory analysis of the Rosenberg self-Esteem scale. *Personality and Social Psychology Bulletin, 23*, 443-451. doi: 10.1177/0146167297235001

Hall, J. A., Andrzejewski, S. A., & Yopchick, J. E. (2009). Psychosocial correlates of interpersonal sensitivity: A meta-analysis. *Journal of Nonverbal Behavior, 33*, 149-180. doi:10.1007/s10919-009-0070-5

Hastings, M. E., Tangney, J. P., & Stuewig, J. (2008). Psychopathy and identification of facial expressions of emotion. *Personality and Individual Differences, 44*, 1474-1483. doi: 10.1016/j.paid.2008.01.004

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology, 44*, 227-239. doi: 10.1348/014466505X29657

Honan, C. A., McDonald, S., Sufani, C., Hine, D. W., & Kumfor, F. (2016). The awareness of social inference test: development of a shortened version for use in adults with acquired brain injury. *The Clinical Neuropsychologist, 30*(2), 243-264. doi: 10.1080/13854046.2015.1136691

Hornak, J., Bramham, J., Rolls, E. T., Morris, R. G., O'Doherty, J., Bullock, P. R., & Polkey, C. E. (2003). Changes in emotion after circumscribed surgical lesions of the orbitofrontal and cingulate cortices. *Brain, 126,* 1691-1712. doi: 10.1093/brain/awg168

John, O. P., & Robins, R. W. (1994). Accuracy and bias in self-perception: Individual differences in self-enhancement and the role of narcissism. *Journal of personality and social psychology, 66,* 206-219. doi: 10.1037/0022-3514.66.1.206

Jonason, P. K., & Krause, L. (2013). The emotional deficits associated with the Dark Triad traits: Cognitive empathy, affective empathy, and alexithymia. *Personality and Individual Differences, 55,* 532-537. doi: 10.1016/j.paid.2013.04.027

Jones, D. N., & Paulhus, D. L. (2013). Introducing the short dark triad (SD3) a brief measure of dark personality traits. *Assessment, 21,* 28-41. doi: 10.1177/1073191113514105

Kelly, K. J., & Metcalfe, J. (2011). Metacognition of emotional face recognition. *Emotion, 11,* 896-906. doi:10.1037/a0023746

Konrath, S., Corneille, O., Bushman, B. J., & Luminet, O. (2013). The relationship between narcissistic exploitativeness, dispositional empathy, and emotion recognition abilities. *Journal of Nonverbal Behavior, 38,* 129-143. doi:10.1007/s10919-013-0164-y

Kosson, D. S., Suchy, Y., Mayer, A. R., & Libby, J. (2002). Facial affect recognition in criminal psychopaths. *Emotion,* 398. doi: 10.1037/1528-3542.2.4.398

Levy, K. N. (2012). Subtypes, dimensions, levels, and mental states in narcissism and narcissistic personality disorder. *Journal of Clinical Psychology, 68,* 886-897. doi: 10.1002/jclp.21893

Lovibond, S. H. & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales* (2nd ed.) Sydney: Psychology Foundation.

Marissen, M. A., Deen, M. L., & Franken, I. H. (2012). Disturbed emotion recognition in patients with narcissistic personality disorder. *Psychiatry Research, 198,* 269-273. doi: 10.1016/j.psychres.2011.12.042

Marsh, A. A., & Blair, R. J. R. (2008). Deficits in facial affect recognition among antisocial populations: A meta-analysis. *Neuroscience & Biobehavioral Reviews, 32,* 454-465. doi: 10.1016/j.neubiorev.2007.08.003

Marsh, A. A., Finger, E. C., Mitchell, D. G., Reid, M. E., Sims, C., Kosson, D. S., . . . Blair, R. (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous-unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry, 165,* 712-720. doi: 10.1176/appi.ajp.2007.07071145

Marsh, A. A., Kozak, M. N., & Ambady, N. (2007). Accurate identification of fear facial expressions predicts prosocial behavior. *Emotion, 7,* 239. doi: 10.1037/1528-3542.7.2.239

Mayer, J. D., & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence, 17,* 433-442. Retrieved from https://eclass.teicrete.gr/modules/document/file.php/IP-ERLSF116/Mayer-Salovey.1993-libre.pdf

McDonald, S., Gowland, A., Randall, R., Fisher, A., Osborne-Crowley, K., & Honan, C. (2014). Cognitive factors underpinning poor expressive communication skills after traumatic brain injury: Theory of mind or executive function? *Neuropsychology, 28,* 801-811. doi: 10.1037/neu0000089

McDonald, S., Honan, C., Kelly, M., Byom, L., & Rushby, J. (2013). Disorders of social cognition and social behaviour following severe TBI. In S. Mcdonald, L. Togher & C. Code (Eds.), *Social and communication disorders following traumatic brain injury* (2nd ed; pp. 119-159). London: Psychology Press.

Miller, J. D., & Campbell, W. K. (2010). The case for using research on trait narcissism as a building block for understanding narcissistic personality disorder. *Personality Disorders, 1,* 180-191. doi:10.1037/a0018229

Miller, J. D., Campbell, W. K., & Pilkonis, P. A. (2007). Narcissistic personality disorder: Relations with distress and functional impairment. *Comprehensive Psychiatry, 48,* 170-177. doi: 10.1016/j.comppsych.2006.10.003

Miller, J. D., Gentile, B., Wilson, L., & Campbell, W. K. (2013). Grandiose and vulnerable narcissism and the DSM–5 pathological personality trait model. *Journal of Personality Assessment, 95,* 284-290. doi: 10.1080/00223891.2012.685907

Miller, J. D., Lynam, D. R., Hyatt, C. S., & Campbell, W. K. (2017). Controversies in Narcissism. *Annual Review of Clinical Psychology, 13,* 291-315. doi: 10.1146/annurev-clinpsy-032816-045244

Miller, J. D., McCain, J., Lynam, D. R., Few, L. R., Gentile, B., MacKillop, J., & Campbell, W. K. (2014). A comparison of the criterion validity of popular measures of narcissism and narcissistic personality disorder via the use of

expert ratings. *Psychological Assessment, 26,* 958-969. doi: : 10.1037/a0036613

Montagne, B., Kessels, R. P. C., de Haan, E. H. F., & Perrett, D. I. (2007). The emotion recognition task: A paradigm to measure the perception of facial emotional expressions at different intensities. *Perceptual and Motor Skills, 104*, 589-598. doi: 10.2466/pms.104.2.589-598

Montagne, B., Kessels, R. P. C., Frigerio, E., de Haan, E. H. F., & Perrett, D. I. (2005). Sex differences in the perception of affective facial expressions: Do men really lack emotional sensitivity? *Cognitive Processing, 6,* 136-141. doi: 10.1007/s10339-005-0050-6

Montagne, B., van Honk, J., Kessels, R. P., Frigerio, E., Burt, M., van Zandvoort, M. J., . . . de Haan, E. H. (2005). Reduced efficiency in recognising fear in subjects scoring high on psychopathic personality characteristics. *Personality and Individual Differences, 38,* 5-11. doi: 10.1016/j.paid.2004.02.008

Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry, 12*, 177-196. doi:10.1207/s15327965pli1204_1

Nagler, U. K., Reiter, K. J., Furtner, M. R., & Rauthmann, J. F. (2014). Is there a "dark intelligence"? Emotional intelligence is used by dark personalities to emotionally manipulate others. *Personality and Individual Differences, 65,* 47-52 doi: 10.1016/j.paid.2014.01.025

Palmer, M. A., Brewer, N., Weber, N., & Nagesh, A. (2013). The confidence-accuracy relationship for eyewitness identification decisions: Effects of exposure duration, retention interval, and divided attention. *Journal of Experimental Psychology: Applied, 19*, 55. doi:10.1037/a0031602

Pincus, A. L., Ansell, E. B., Pimentel, C. A., Cain, N. M., Wright, A. G. C., & Levy, K. N. (2009). Initial construction and validation of the Pathological Narcissism Inventory. *Psychological Assessment, 21,* 365- 379. doi: 10.1037/a0016530

Park, S. W., & Colvin, C. R. (2014). Narcissism and discrepancy between self and friends' perceptions of personality. *Journal of Personality, 82,* 278-286. doi: 10.1111%2Fjopy.12053

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: narcissism, machiavellianism, and psychopathy. *Journal of Research in Personality, 36,* 556-563. doi: 10.1016/S0092-6566(02)00505-6

Pera-Guardiola, V., Contreras-Rodríguez, O., Batalla, I., Kosson, D., Menchón, J. M., Pifarré, J., . . . Soriano-Mas, C. (2016). Brain structural correlates of emotion recognition in psychopaths. *PloS one, 11*, e0149807 doi: 10.1371/journal.pone.0149807

Petrides, K. V., Vernon, P. A., Schermer, J. A., & Veselka, L. (2011). Trait emotional intelligence and the dark triad traits of personality. *Twin Research and Human Genetics, 14,* 35-41. doi: 10.1375/twin.14.1.35

Phillips, M. L., Drevets, W. C., Rauch, S. L., & Lane, R. (2003). Neurobiology of emotion perception I: The neural basis of normal emotion perception. *Biological Psychiatry, 54,* 504-514. doi: 10.1016/s0006-3223(03)00168-9

Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports, 45,* 590. doi: 10.2466/pr0.1979.45.2.590

Ritter, K., Dziobek, I., Preissler, S., Rüter, A., Vater, A., Fydrich, T., . . . Roepke, S. (2011). Lack of empathy in patients with narcissistic personality disorder. *Psychiatry Research, 187*, 241-247. doi: 10.1016/j.psychres.2010.09.013

Ronningstam, E. (2011). Narcissistic personality disorder in DSM-V--in support of retaining a significant diagnosis. *Jounal of Personality Disorders, 25,* 248-259. doi:10.1521/pedi.2011.25.2.248

Ronningstam, E., & Baskin-Sommers, A. R. (2013). Fear and decision-making in narcissistic personality disorder—a link between psychoanalysis and neuroscience. *Dialogues in Clinical Neuroscience, 15,* 191. doi: PMC3811090

Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). *Acceptance and commitment therapy. Measures package, 61,* 52. Retrieved from: http://www.integrativehealthpartners.org/downloads/ACTmeasures.pdf#page=61

Rosenberg, H., McDonald, S., Dethier, M., Kessels, R. P. C., & Westbrook, R. F. (2014). Facial emotion recognition deficits following moderate-severe traumatic brain injury (TBI): Re-examining the valence effect and the role of emotion intensity. *Journal of the International Neuropsychological Society, 20,* 994-1003. doi:10.1017/S1355617714000940

Schulze, L., Dziobek, I., Vater, A., Heekeren, H. R., Bajbouj, M., Renneberg, B., . . . Roepke, S. (2013). Gray matter abnormalities in patients with narcissistic personality disorder. *Journal of Psychiatric Research, 47,* 1363-1369. doi:10.1016/j.jpsychires.2013.05.017

Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy?: Self-esteem matters. *Journal of Personaltiy and Social Psychology, 87,* 400-416. doi: 10.1037/0022-3514.87.3.400

Tabachnick, B. & Fidell, L. (2013). *Using multivariate statistics*, 6th Edition, New Jersey: Pearson.

Twenge, J. M. (2013). The evidence for generation me and against generation we. *Emerging Adulthood, 1*, 11-16. doi:10.1177/2167696812466548

Twenge, J. M., & Foster, J. D. (2010). Birth cohort increases in narcissistic personality traits among American college students, 1982-2009. *Social Psychological and Personality Science, 1*, 99-106. doi: 10.1177/1948550609355719

Vater, A., Schroder-Abe, M., Ritter, K., Renneberg, B., Schulze, L., Bosson, J. K., & Roepke, S. (2013). The narcissistic personality inventory: A useful tool for assessing pathological narcissism? Evidence from patients with narcissistic personality disorder. *Journal of Personality Assessment, 95*, 301-308. doi:10.1080/00223891.2012.732636

Vize, C. E., Lynam, D. R., Collison, K., & Miller, J. D. (2016). Differences among dark triad components: A meta-analytic investigation. *Personality Disorders: Theory, Research, and Treatment.* Advance online publication. doi: 10.1037/per0000222

Vonk, J., Zeigler-Hill, V., Mayhew, P., & Mercer, S. H. (2013). Mirror, mirror on the wall, which form of narcissist knows self and others best of all? *Personality and Individual Differences, 54*, 396-401. doi: 10.1016/j.paid.2012.10.010

Vredeveldt, A., & Sauer, J. D. (2015). Effects of eye-closure on confidence-accuracy relations in eyewitness testimony. *Journal of Applied Research in Memory and Cognition, 4*, 51-58. doi: 10.1016/j.jarmac.2014.12.006

Wai, M., & Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the dark triad of personality. *Personality and Individual Differences, 52,* 794-799. doi: 10.1016/j.paid.2012.01.008

Watson, P., & Morris, R. J. (1991). Narcissism, empathy and social desirability. *Personality and Individual Differences, 12,* 575-579. doi: 10.1016/0191-8869(91)90253-8

Weber, N., & Brewer, N. (2004). Confidence-accuracy calibration in absolute and relative face recognition judgments. *Journal of Experimental Psychology: Applied, 10,* 156. doi:10.1037/1076-898X

Yaniv, I., Yates, J. F., & Smith, J. K. (1991). Measures of discrimination skill in probabilistic judgment. *Psychological bulletin, 110,* 611. doi:10.1037/0033-2909.110.3.611

Appendix

Appendix A Ethics Approval

Sent: Thursday, 27 April 2017 9:32 AM
To: Cynthia Honan
Cc: Nikki Turner
Subject: Ethics Application Approved: H0016480 An investigation of emotion recognition ability and metacognition

Dear Dr Honan

Ethics Ref No: H0016480
Project title: An investigation of emotion recognition ability and metacognitive judgements of emotion recognition performance in trait narcissism

The above Minimal Risk application has been approved by the Chair of the Tasmania Social Sciences Human Research Ethics Committee, on behalf of the full committee. Approval is for four years and conditional upon receipt of an annual Progress Report. Ethics approval for this project will lapse if a Progress Report is not submitted.

A copy of the approval letter will be for your records. Because evidence of ethics approval will be necessary for thesis submission, all researchers have been copied on this email.

The Ethics Committee wishes you all the best with the project.

Kind regards

Jude Vienna-Hallam

--
Jude Vienna-Hallam
Ethics Administrator
Office of Research Services
University of Tasmania
Private Bag 01
Hobart TAS 7001
Phone: (03) 6226 6254
Fax: (03) 6226 2765
Email: Jude.ViennaHallam@utas.edu.au
Web: http://www.utas.edu.au/research-admin

Appendix B Participant Recruitment Flyer

Research Volunteers Wanted

Personality and Emotion Recognition Ability

Are you aged between 18-35 years?

We are looking for volunteers to participate in a study investigating certain personality traits on emotion perception ability.

As a participant, you will be asked to complete some brief baseline questionnaires, and undertake a computer-based emotion recognition task. The questionnaires and testing should take no longer than 45 minutes to complete.

To volunteer or for more information, please email nhallan@utas.edu.au

---

Receive a $20 gift voucher

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee (H0016480)

Appendix C Participant Information Sheet

Personality, Emotion Perception and Perceptions of Ability.

Information Sheet for Participants

Invitation

You are invited to participate in a research project examining the relationship between specific personality traits and emotion perception ability. This research is being conducted in partial fulfillment of an Honours degree in psychology for Nikki Turner under the supervision of Dr. Cynthia Honan a Lecturer and Clinical Neuropsychologist in the Discipline of Psychology, School of Medicine, University of Tasmania.

What is the purpose of this study?

The purpose of this study is to examine the relationship between personality and how emotions in other people are perceived. It is possible that the way we appraise the emotions of others is dependent on a person's specific personality traits.

Why have I been invited to participate?

You have been invited to participate because you meet the following criteria:

- ✓ Are aged between 18 and 35 years of age.
- ✓ Have normal or corrected-to-normal vision.
- ✓ Are fluent in English.
- ✓ Are not pregnant.
- ✓ You have no history of traumatic brain injury or other neurological condition.
- ✓ You are able to spend approximately 20 minutes to complete questionnaires and a further 20 minutes to complete an emotion perception task.

What will I be asked to do?

You will be asked to complete some standard questionnaires which will ask you for basic demographic information, and information relating to your current mood, personality traits and social functioning. You will also be asked to complete an emotion recognition task on the computer.

It is expected that the questions and task together will take approximately 45 minutes to complete.

Are there any possible benefits from participation in this study?

Your participation will help us to understand the way in which personality traits may be related to the perception of emotions in others. This will allow us to identify whether specific personality groups exhibit specific social difficulties and will inform future research into the possible mechanisms that may underlie social difficulties.

University of Tasmania students who are undertaking the KHA111/KHA112 course will receive 45 minutes of course credit for their time. Participants who are not undertaking the KHA111/KHA112 course will receive a $20 voucher in exchange for their time.

Are there any possible risks from participation in this study?
We do not expect there will be any risks associated with participation in this study. The data collected will be in no way identifiable to you.

What if I change my mind during or after the study?
Participation in this research project is voluntary and you are free to withdraw at any time. Participants who withdraw during the research process are free to do so with no explanation. Your withdrawal will not in any way affect your relationship with the researchers involved in this study or the School of Medicine. Should you withdraw from participating at any time, your data will be destroyed and will not be included in the final study results.

What will happen to the information when this study is over?
The data from this study will be stored securely within the Discipline of Psychology, School of Medicine. Your data will also be stored anonymously using a unique ID code and any identifiable information such as your name and contact details will not be kept.

Data you provide in this research will be stored for a period of five years following the completion of the study. After this period, all data will be destroyed.

How will the results of the study be published?
The results will be published in an Honours thesis by Nikki Turner. This will be available at the University of Tasmania library after the 3rd November, 2017. A summary of the research results will also be available on the discipline of Psychology, University of Tasmania webpage (http://www.utas.edu.au/courses/study/psychology).

No participants will be identifiable in the publication of the results. Research results may be published in a peer-reviewed academic journal. Research results can also be obtained by contacting the researchers directly.

What if I have questions about this study?
If you have any questions regarding this research, please contact Nikki Turner (nhallan@utas.edu.au). Alternatively, you can contact Dr Cynthia Honan on 03 6324 3266 or email cynthia.honan@utas.edu.au.

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on +61 3 6226 6254 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H0016480.

This information sheet is for you to keep. If you would like to participate in the research, please ask the researcher for a participant consent form to complete.

Thank you for taking the time to read this information sheet.

Appendix D Participant Consent Form

Personality, Emotion Perception and Perceptions of Ability

Consent form for participants

1. I agree to take part in the research study named above.
2. I have read and understood the Information Sheet for this study.
3. The nature and possible effects of the study have been explained to me.
4. I understand that the study involves completing questionnaires to determine demographic information, current mood, levels of trait narcissism and psychological functioning. Participants will then be asked to complete an emotion recognition task on the computer.
5. I understand that participation involves no foreseeable risks to participants.
6. I understand that all research data will be securely stored on the Psychology Department, School of Medicine premises for five years from the publication of the study results, and will then be destroyed.
7. Any questions that I have asked have been answered to my satisfaction.
8. I understand that the researcher(s) will maintain confidentiality and that any information I supply to the researcher(s) will be used only for the purposes of the research.
9. I understand that the results of the study will be published so that I cannot be identified as a participant.
10. I understand that my participation is voluntary and that I may withdraw at any time without any effect.

    If I so wish, I may request that any data I have supplied be withdrawn from the research during testing. I understand that I will not be able to withdraw my data after completing the testing session as data will be anonymous.

Participant's name:

_____

Participant's signature:

_____

Date: _____

Statement by Investigator

☐ I have explained the project and the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation.

If the Investigator has not had an opportunity to talk to participants prior to them participating, the following must be ticked.

☐ The participant has received the Information Sheet where my details have been provided so participants have had the opportunity to contact me prior to consenting to participate in this project.

Investigator's name:

_____

Investigator's signature:

_____

Date: _____